ACTUATOR USING ELECTROMECHANICAL TRANSDUCER

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Abstract

PROBLEM TO BE SOLVED: To provide a linear actuator using a piezoelectric element large in mechanical strength, high in reliability, and easy of assembly.
SOLUTION: The right and left ends of the tubular piezoelectric element 14 having PZT for its main component are supported by supporting members 12 and 13, and a slider 15 is frictionally coupled with the piezoelectric element 14. Drive pulses at slow rise parts and rapid fall parts, to the electrodes 16 and 17, and drive pulses of reverse polarity in the same waveform, to the electrode 17, are applied in condition that both the electrodes 16 and 17 at the right and left ends of the piezoelectric element are polarized in the same direction in radial direction. Elongating displacement, at the section of the electrode 16, and shrinking displacement, at the section of the electrode 17, come into existence with the slow rise parts of the drive pulses, and the slider 15 shifts in the direction of an arrow (a). Though the displacement occurring in the piezoelectric element with rapid rise part of the drive pulses returns quickly to the former condition, it produces slippage between the slider 15 and the piezoelectric element 14, consequently the slider 15 shifts in the direction of an arrow (a).